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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/830,118	04/23/2004	David A. Williams	119480	9011

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EXAMINER
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HANAN, DEVIN J

ART UNIT	PAPER NUMBER
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3745

DATE MAILED: 09/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/830,118

Applicant(s)

WILLIAMS ET AL.

Examiner

Devin Hanan

Art Unit

3745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 and 23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10, 12-14, 16, 21 and 23 is/are rejected.
- 7) ☒ Claim(s) 9, 11, 15 and 17-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/23/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

A preliminary amendment, dated 4/23/2004, cancelled claims 22 and 24.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5, 6, 8, 10 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Thorp (U.S. Patent 2,642,263).

Thorp discloses a damped aerofoil structure with the aerofoil having a first wall (15) and a second opposing wall (16) and vibration damping for damping relative movement of the first and second wall where the damping means comprise at least two cooperating elements (col. 2 lines 27-29), a first damping element (23) mounted to the first wall of the structure and a second damping element (also 23) mounted to the second wall of the structure.

Regarding claim 2, Thorp discloses all of the limitations of claim 1 and the first and second wall together define an enclosed cavity and the vibration damping means is located within the cavity, the first damping element mounted to the inner surface of the

first wall of the structure and the second damping element mounted to the inner surface of the second wall of the structure (col. 2-3 lines 51-3).

Regarding claim 3, Thorp discloses all of the limitations of claim 1 and the first and second damping elements are in frictional engagement with one another (col. 2 lines 53-54).

Regarding claim 5, Thorp discloses all of the limitations of claim 1 and the damping means provide structural support to the aerofoil structure.

Regarding claim 6, Thorp discloses all of the limitations of claim 1 and the damping means forms reinforcing ribs that cooperate with the first and second wall of the aerofoil to form a girder structure (capability to reinforce is shown in figure 2).

Regarding claim 8, Thorp discloses all of the limitations of claim 3 and the first and second damping elements are in nestled arrangement (col. 2 lines 27-32).

Regarding claim 10, Thorp discloses all of the limitations of claim 1 and the first and second damping elements comprise corrugated sheets (col. 2 lines 27-32).

Regarding claim 21, the use of the damped aerofoil in a fan of a turbofan engine does not represent a limitation as the examiner assumes the use in a turbofan engine is the intended use of the damped aerofoil.

Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Baskin (U.S. Patent 4,188,171).

Baskin discloses a damped aerofoil structure with the aerofoil having a first wall (pressure side) and a second opposing wall (suction side) and vibration damping for

damping relative movement of the first and second wall where the damping means comprise at least two cooperating elements, a first damping element mounted to the first wall of the structure and a second damping element mounted to the second wall of the structure (embodiment of figure 4).

Regarding claim 4, Baskin discloses all of the limitations of claim 1 and the first and second damping elements are in frictional engagement with an interposed third damping element (col. 3 lines 40-45).

Claims 1, 4 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Von Benken (U.S. Patent 5,284,011).

Von Benken discloses a damped aerofoil structure with the aerofoil having a first wall (38) and a second opposing wall (40) and vibration damping for damping relative movement of the first and second wall where the damping means comprise at least two cooperating elements, a first damping element mounted to the first wall of the structure and a second damping element mounted to the second wall of the structure (two elements 62 are mounted to both 38 and 40).

Regarding claim 4, Von Benken discloses all of the limitations of claim 1 and the first and second damping elements are in frictional engagement (col. 4 lines 49-65) with an interposed third (48) damping element.

Regarding claim 5, Von Benken discloses all of the limitations of claim 1 and the damping means provide structural support to the aerofoil structure (elements 62 are struts, col. 4 lines 49-65).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7, 12-14, 16 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thorp in view of Farrar et al. (U.S. Patent 6,524,074).

Thorp discloses all of the limitations of claims 1 and 5, but does not specifically disclose the girder structure is a warren girder.

However, Farrar et al. teaches for a corrugated structure, namely a warren girder, for the purposes of using a certain type of corrugated structure (col. 3 lines 27-35).

Since Farrar et al. and Thorp are both corrugated aerofoils, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the damped aerofoil of Thorp by including the warren girder of Farrar et al. for the purposes of using a certain type of corrugated structure.

Regarding claims 12 and 13, Thorp discloses all of the limitations of claim 1, but does not disclose that the first and second damping elements are diffusion bonded to one another about their periphery.

However, Farrar et al. teaches of making a corrugated structure inside of the airfoil by first diffusion bonding the periphery (col. 1 lines 46-52) for the purpose of

making it possible to use different construction means, namely superplastic forming (col. 4 lines 3-6).

Since Farrar et al. and Thorp are both corrugated aerofoils, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the damped aerofoil of Thorp by including the diffusion bonded periphery of Farrar et al. for the purpose of making it possible to use different construction means, namely superplastic forming (col. 4 lines 3-6).

Regarding claim 14, Thorpe discloses all of the limitations of claim 1, but does not specifically disclose that the first and second damping elements are formed by superplastic forming process.

However, Farrar et al. teaches of using a superplastic forming process (col. 3-4 lines 66-6) as a method to construct airfoils from titanium alloys (col. 3-4 lines 66-6).

Since Farrar et al. and Thorp are both corrugated aerofoils, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the damped aerofoil of Thorp by making it by the superplastic forming of Farrar et al. as a method to construct airfoils from titanium alloys (col. 3-4 lines 66-6).

Regarding claim 16, Thorpe discloses all of the limitations of claim 1, but does not specifically disclose that the first and second damping elements are made of a titanium alloy.

However, Farrar et al. teaches of making the damping elements of a titanium alloy (col. 4 lines 19-21) as an alternative material that is superplastically formable.

Since Farrar et al. and Thorp are both corrugated aerofoils, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the damped aerofoil of Thorp by making it of titanium as suggested by Farrar et al. as an alternative material that is superplastically formable (col. 4 lines 19-21).

Regarding claim 23, the modified apparatus of Thorp discloses all of the claimed limitations as discussed in claims 12-14 above.

### ***Allowable Subject Matter***

Claims 9, 11, 15 and 17-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Prior Art***

The patent to Velicki (U.S. Patent 5,384,959) was cited for its teaching of a superplastically formed airfoils with continuous perimeter spot welds (col. 5 lines 2-5) and diffusion bonding (col. 2 lines 7-12). Also, Velicki discloses that the diffusion bonding/superplastic forming process of hollow core fan blades is advantageous due to its cost efficiency (col. 2 lines 9-10).

The patent to Flader (U.S. Patent 2,921,769) was cited for its teaching of cooling structures which help resist vibratory stresses (col. 1 lines 26-29).

***Conclusion***

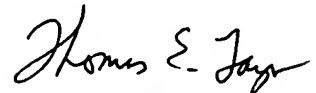
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devin Hanan whose telephone number is 571-272-6089. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on 571-272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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